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SINGLE PHOTON DETECTOR BASED ON SUPERCONDUCTING AMORPHOUS REFRACTORY-METAL-METALLOID ALLOY NANOWIRE

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Abstract

A superconducting nanowire single photon detector (SN-SPD) microelectric circuit is describes which has higher quantum efficiency and signal-to-noise than any SN-SPD's known in the art. The material and configuration of the microelectronic circuit eliminates the polarization independence ; and high signal-to-noise is achieved by vertically stacking two tungsten silicide (TS) SN-SPDs and electrically connecting them in parallel. This structure forms a multilayer superconducting nanowire avalanche photo-detector (SNAP). A single photon detection devive employing the multilayer (SNAP) microelectronic circuit demonstrates a peak system detection efficiency of 87.7% and a polarization dependence of less than 2%. This represents nearly an order of magnitude improvement in both system detection efficiency and reduction in polarization dependence compared to conventional SNSPDs.

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References

- 11-011Application

Status of Availability

This invention is available for licensing exclusively or non-exclusively in any field of use.

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